What is claimed is:

1. A multi-layer circuit board, comprising:

(a) a double-side circuit board including a first substrate, a plurality of first through conductors disposed in said first substrate, bonding layers disposed on either side of said first substrate, and a first circuit pattern and a second circuit pattern disposed on the surface of said bonding layer,

said first circuit pattern and said second circuit pattern being electrically connected to each other by said first through conductors;

(b) an intermediate substrate including a second substrate, a plurality of second through conductors disposed in said second substrate, and a first bonding layer and a second bonding layer disposed on either side of said second substrate,

said first bonding layer and said second bonding layer being disposed on either side of said substrate except said second through conductors, and said intermediate substrate being disposed on the surface of at least one of said first circuit pattern and said second circuit pattern.

2. The multi-layer circuit board of claim 1,

wherein said bonding layer is connected to at least one of said first bonding layer and said second bonding layer, while said intermediate substrate and said double-side circuit board

are connected to each other.

3. The multi-layer circuit board of claim 1, further comprising:

(c) an additional circuit pattern disposed on the surface of said intermediate substrate,

said additional circuit pattern being electrically connected to at least one of said first circuit pattern and said second circuit pattern by said second through conductors.

4. The multi-layer circuit board of claim 3,

wherein said intermediate substrate includes a first intermediate substrate disposed on the surface of said first circuit pattern, and a second intermediate substrate disposed on the surface of said second circuit pattern;

said additional circuit pattern includes a third circuit pattern disposed on the surface of said first intermediate substrate, and a fourth intermediate substrate disposed on the surface of said second intermediate substrate;

said third circuit pattern is electrically connected to said first circuit pattern by the second through conductors disposed in said first intermediate substrate; and

said fourth circuit pattern is electrically connected to said second circuit pattern by the second through conductors disposed in said second intermediate substrate.

5. The multi-layer circuit board of claim 3,

wherein said additional circuit pattern is a circuit pattern located at the outermost layer position.

6. The multi-layer circuit board of claim 1,

wherein said double-side circuit board further includes a smoothing layer, and

said smoothing layer is disposed on said bonding layer in concavities where none of said first circuit pattern and said second circuit pattern are formed.

7. The multi-layer circuit board of claim 1,

wherein said first substrate has incompressibility.

8. The multi-layer circuit board of claim 1,

wherein said second substrate has incompressibility.

9. The multi-layer circuit board of claim 1,

wherein said first substrate and said second substrate have incompressibility that is given by heating a composite material under pressures, and

said composite material contains woven or non-woven fabric using aromatic polyamide as main material, and thermosetting resin.

10. The multi-layer circuit board of claim 1,

wherein said first bonding layer and said second bonding layer are formed in a state of being half-cured, and become cured after lamination of said double-side circuit board and said intermediate substrate.

11. The multi-layer circuit board of claim 1,

wherein said double-side circuit board includes a plurality of double-side circuit boards;

said intermediate substrate is located between said double-side circuit boards;

said bonding layer is bonded to at least one of said first bonding layer and said second bonding layer, while said intermediate substrate and said double-side substrate are bonded to each other; and

said circuit patterns of said respective double-side circuit boards are electrically connected to each other by said second through conductors.

12. The multi-layer circuit board of claim 1,

wherein said second bonding layer disposed on said intermediate substrate is positioned so as to be filled into concavities of at least one circuit pattern of said first circuit pattern and said second circuit pattern, on a surface

where said double-side circuit board and said intermediate substrate are laminated.

13. The multi-layer circuit board of claim 1,

wherein said first bonding layer and said second bonding layer contain thermosetting resin.

14. The multi-layer circuit board of claim 1,

wherein at least one of said first substrate and said second substrate includes a roughened surface, and said bonding layer, said first bonding layer, and

said second bonding layer are disposed on the roughened surface.

15. The multi-layer circuit board of claim 1,

wherein said bonding layer is in a range of about 5 μm to about 15 μm in thickness.

16. A method of manufacturing a circuit board, comprising the steps of:

(a) manufacturing an intermediate substrate, including the steps of:

(i) manufacturing a substrate having incompressibility,

(ii) forming bonding layers on either side of said substrate,

(iii) forming a plurality of through-holes in said substrate, and

(iv) filling conductive paste into said through-holes; and

(b) manufacturing a double-side circuit board, including the steps of:

(v) laminating metallic foils to either side of said intermediate substrate and heating same under pressures, and

(vi) forming a first circuit pattern and a second circuit pattern by processing said metallic foils.

17. The method of manufacturing a circuit board of claim 16,

wherein the step of manufacturing said substrate comprises a step of heating under pressures a composite material consisting of fiber aggregate and thermosetting resin impregnated to said fiber aggregate.

18. The method of manufacturing a circuit board of claim 17,

wherein said fiber aggregate contains at least one selected from the group consisting of inorganic fiber, ceramic fiber, organic fiber, and glass fiber.

19. The method of manufacturing a circuit board of claim

16,

wherein the step of forming said bonding layer comprises the steps of:

laminating releasing films having a film material and adhesive disposed on said film material to either side of said substrate; and

removing only said film material from said substrate,

whereby said bonding layers are disposed on either side of said substrate.

20. The method of manufacturing a circuit board of claim 16,

wherein the step of manufacturing said intermediate substrate comprises the steps of:

disposing said bonding layer and film on either side of said substrate;

then, forming a plurality of through-holes in said substrate with said bonding layer and said film disposed thereon;

then, filling conductive paste into said through-holes, using the film as a mask; and

removing thereafter said film.

21. The method of manufacturing a circuit board of claim 20,

wherein said bonding layer remains on the surface of said substrate with said film material removed; and

said conductive paste equivalent in thickness to said film material is protruded from said bonding layer.

22. The method of manufacturing a circuit board of claim 16,

wherein said bonding layer in the above step (ii) is formed in a state of being half-cured.

23. The method of manufacturing a circuit board of claim 16, further comprising the steps of:

(c) laminating a first intermediate substrate and a second intermediate substrate sandwiching therebetween a double-side circuit board manufactured in the above step (b), laminating a third metallic foil to the surface of said first intermediate substrate, and laminating a fourth metallic foil to the surface of said second intermediate substrate,

said first intermediate substrate and second intermediate substrate being same in configuration as said intermediate substrate manufactured in the above step (a);

(d) heating under pressures said third metallic foil, said first intermediate substrate, said double-side circuit board, said second intermediate substrate, and said fourth metallic foil which are laminated; and

(e) forming a third circuit pattern and a fourth circuit pattern by processing said third metallic foil and said fourth metallic foil, thereby manufacturing a four-layer circuit board.

24. The method of manufacturing a circuit board of claim 23,

wherein each of said first intermediate substrate and said second intermediate substrate has a protrusion of said conductive paste protruded from the surface of said bonding layer, and

in the above step (d),

the protrusion of said conductive paste is compressed, and said metallic foils disposed on either side of said intermediate substrates are electrically connected to each other by said conductive paste in said through-holes.

25. The method of manufacturing a circuit board of claim 16, further comprising the steps of:

(f) laminating a first double-side circuit board and a second double-side circuit board sandwiching therebetween a first intermediate substrate,

said first double-side circuit board being said double-side circuit board,

said second double-side circuit board being same in

configuration as said double-side circuit board, and

said intermediate substrate being same in configuration as said intermediate substrate manufactured in the above step (a); and

(g) heating under pressures said first double-side circuit board, said intermediate substrate, and said second double-side circuit board which are laminated.

26. The method of manufacturing a circuit board of claim 16, further comprising the steps of:

(h) manufacturing a first bonding substrate and a second bonding substrate,

said first bonding substrate and said second bonding substrate having bonding layers disposed on either side of a first substrate, and

said first substrate having incompressibility;

(i) laminating said first bonding substrate and said second bonding substrate sandwiching therebetween said double-side circuit board manufactured in the above step (b),

laminating a third metallic foil to the surface of said first bonding substrate, and laminating a fourth metallic foil to the surface of said second boding substrate,

laminating a first bonding layer and a first releasing film to the surface of said third metallic foil, and

laminating a second bonding layer and a second releasing

film to the surface of said fourth metallic foil;

(j) forming a plurality of non-through-holes in each of said first substrate, said first film, said second substrate, and said second film;

(k) filling conductive paste into said non-through-holes;

(l) removing said first film and said second film respectively from said bonding layers in a manner such that said first bonding layer and said second bonding layer respectively remain on said first substrate and said second substrate;

(m) disposing a third metallic foil on said first bonding layer, and disposing a fourth metallic foil on said second bonding layer;

(n) heating under pressures said third metallic foil, said first bonding substrate, said double-side circuit board, said second bonding layer, and said fourth metallic foil which are laminated; and

(o) forming a third circuit pattern and a fourth circuit pattern by processing said third metallic foil and said fourth metallic foil, thereby manufacturing a four-layer circuit board.

27. The method of manufacturing a circuit board of claim 23, further comprising the steps of:

(h) manufacturing a first bonding substrate and a second bonding substrate,

said first bonding substrate and second bonding substrate having bonding layers disposed on either side of a first substrate, and said first substrate having incompressibility;

(p) laminating said first bonding substrate and said second bonding substrate sandwiching therebetween said four-layer circuit board manufactured in the above step (e),

laminating a third metallic foil to the surface of said first bonding substrate, and a fourth metallic foil to the surface of said second boding substrate,

laminating a first bonding layer and a first releasing film to the surface of said third metallic foil, and

laminating a second bonding layer and a second releasing film to the surface of said fourth metallic foil;

(q) forming a plurality of non-through-holes in each of said first substrate and said first film, and said second substrate and said second film;

(r) filling conductive paste into said non-through-holes;

(s) removing said first film and said second film respectively from said bonding layers in a manner such that said first bonding layer and said second bonding layer respectively remain on said first substrate and said second substrate;

(t) disposing a third metallic foil on said first bonding layer, and disposing a fourth metallic foil on said second bonding layer;

(u) heating under pressures said third metallic foil, said

first bonding substrate, said four-layer circuit board, said second bonding layer, and said fourth metallic foil which are laminated; and

(v) forming a third circuit pattern and a fourth circuit pattern by processing said third metallic foil and said fourth metallic foil, thereby manufacturing a four-layer circuit board.

28. The method of manufacturing a circuit board of claim 16,

wherein the step of manufacturing said intermediate substrate comprises a step of filling said conductive paste into said through-holes in a manner such that said conductive paste includes a protrusion from the surface of said bonding layer, and

in the above step (v), the protrusion of said conductive paste is compressed by said metallic foil, and

said metallic foils disposed on either side of said intermediate substrates are electrically connected to each other by said conductive paste in said through-holes.

29. The method of manufacturing a circuit board of claim 16,

wherein said bonding layer is in a range of about 5 μm to about 15 μm in thickness.

30. The method of manufacturing a circuit board of claim 16,

wherein the bonding layers disposed on either side of said substrate are different in thickness.

31. The method of manufacturing a circuit board of claim 16,

wherein the step of forming a substrate having incompressibility further comprises a step of roughening the surface of said substrate before forming said bonding layer.

32. The method of manufacturing a circuit board of claim 16,

wherein the step of forming a substrate having incompressibility further comprises a step of eliminating residual stresses.

33. The method of manufacturing a circuit board of claim 16,

wherein the step of forming a substrate having incompressibility further comprises a step of heat-treating said substrate at the glass transition temperature of resin contained in said substrate, whereby residual stresses of said substrate are eliminated.

34. The method of manufacturing a circuit board of claim 16, further comprising the step of:

(w) disposing a smoothing layer on the bonding layer in concavities of at least one circuit pattern of said first circuit pattern and said second circuit pattern of said double-side circuit board.

35. The method of manufacturing a circuit board of claim 34,

wherein said smoothing layer contains resin.

36. The method of manufacturing a circuit board of claim 23, further comprising the step of:

(x) forming a smoothing layer on the bonding layer in concavities of at least one circuit pattern of said first circuit pattern and said second circuit pattern of at least one double-side circuit board of said first double-side circuit board and said second double-side circuit board,

wherein the smoothing layer side is placed on said first intermediate substrate.

37. The method of manufacturing a circuit board of claim 36,

wherein the process of forming said smoothing layer

comprises the steps of:

forming half-cured resin in the concavities, and

laminating said double-side circuit board having said smoothing layer containing the half-cured resin to said first intermediate substrate.